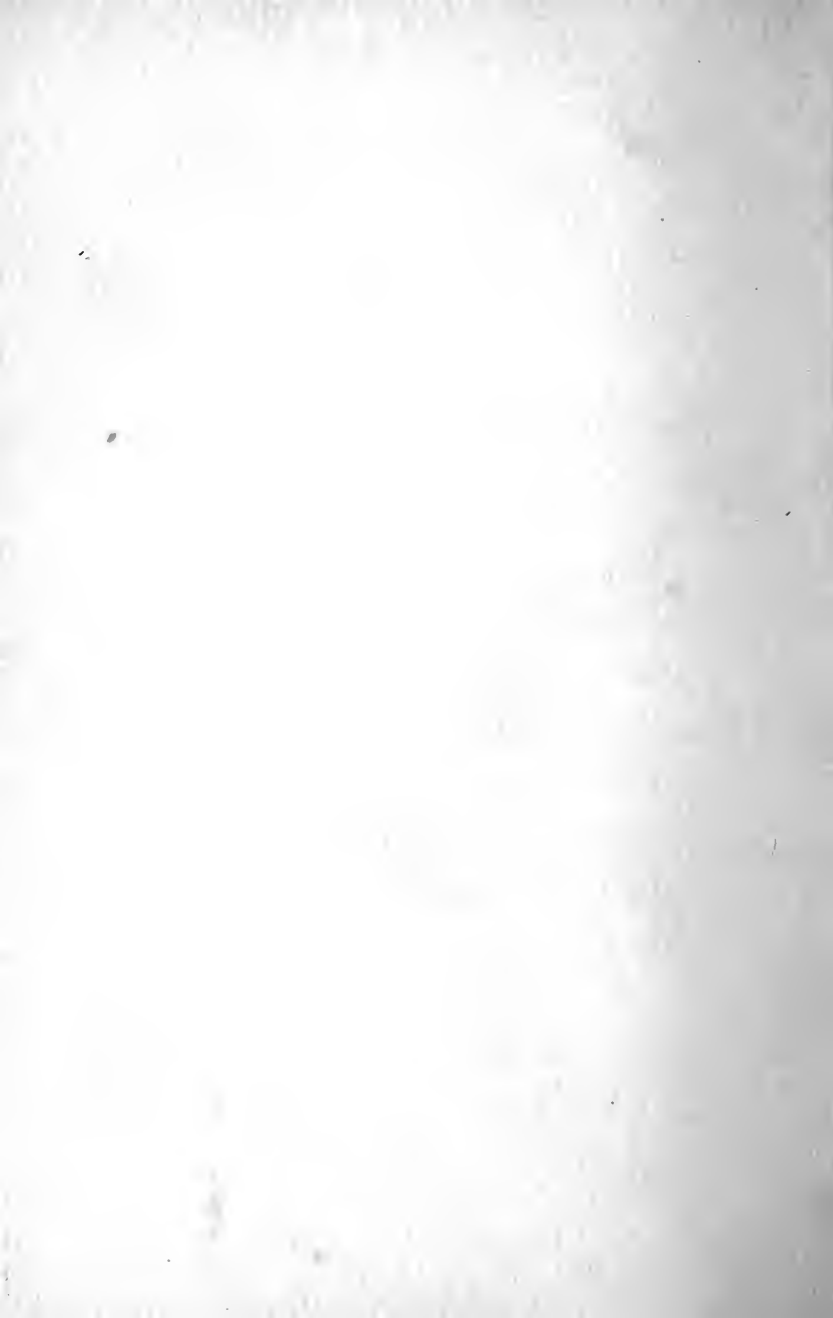


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Architectural Specifications

For the painting, enameling, staining and finishing of woods generally in a medium and first class manner, also for the painting of brick, plaster, cement, concrete, iron, etc. Special attention is called to the notes attached for an explanation of the reason why, etc.

By John J. ...

TT 305
J.S.

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17-7477

PREFACE.

Mr. President and Members of the Master House Painters and Decorators Association of Pennsylvania in convention assembled.

Gentlemen. In compliance with your request and the solicitations of a number of Pennsylvania Architects, I have endeavored to compile a general working specification covering the painting and finishing of wood, brick, plaster, cement, iron and steel. After getting a proper start the work became very fascinating, but as to its ease, try it.

I do not entertain the thought for a moment that all practical house painters will quite agree with me in all my assertions and conclusions. I have not stated them as a theorist, but have drawn from my personal experience of years as man and master in the arts of house painting and finishing. I freely allow to others what I claim for myself. Where a difference of opinion would appear to exist, I am quite sure a satisfactory and practical adjustment could be arrived at without much controversy, or change in these specifications, provided it be not a case of "When Greek meets Greek."

I am quite well aware of many "short cuts" being traversed to produce results cheap and quick, or near right for the present. I have endeavored to make these specifications a standard, for there is no "Royal Road" to a substantially painted and finished structure.

It is not my purpose to exploit any particular materials, but some things not generally known, but of special virtue I have mentioned, firmly believing it to be to your advantage to give them a fair trial. At any time I shall be pleased to attempt to answer any reasonable question regarding these specifications, or materials.

It is practically impossible to provide in these or any stereotyped specifications for all contingencies that arise from time to time. I have endeavored to protect the Architect while being fair to the Painter. I would recommend to the Architect that he select one or more Master Painters in his vicinity having a good reputation and practical knowledge of the business, and that he make in a measure a confidant of such when seeking information regarding materials and the best means to employ or specify for the securing of certain results. No Architect should feel himself as being under any special obligation to such painter or painters, nor would any fair man want him to be.

Hoping this report will in a measure fill the requirements, or at least be the forerunner of some future one more perfect in details,

Very sincerely,

John Dewar,

January, 1913.

Pittsburgh, Pa.

NOTE.---Any person or persons desiring to publish this specification and notes, or any portion of either must receive the consent of the author in writing to do so. A copy will be sent any one interested, on application.

ARCHITECTURAL SPECIFICATIONS.

For the painting, enameling, staining and finishing of woods generally in a medium and first class manner, also for the painting of brick, plaster, cement, concrete, iron, etc. Special attention is called to the notes attached for an explanation of the reason why, etc.

Painting New Exterior Woodwork.

Medium—All knots, rosin and sap portions shall be properly shellaced. Paint one coat white priming brushed well into the wood, after which all nail holes, open joints and other imperfections shall be closed solid with putty containing 20 per cent white lead, then apply two coats of paint, colors to be selected. Each coat must be thoroughly dry before the application of another. Paint the back of all window and door frames one coat before setting, sash runners of window frames to receive two coats of oil, stained if required, the last coat to be applied at completion. No paint to be applied during wet or foggy weather. (See Note 1).

First Class—Wood work should be painted as above specified using one additional coat. (See Note 1)

Repainting of Exterior Wood Work.

Remove such old paint as may be necessary from exterior wood work by scraping, burning

or with paint remover as conditions may require. Sandpaper and touch up with paint one or two coats as found necessary all of that portion from which the old paint has been removed. Paint all wood work two coats, colors to be selected. Do all necessary sandpapering and puttying. (See Note 2).

Staining of Exterior Wood Work.

Medium—All exterior wood work (or a portion as the case may be) to receive one coat of linseed oil stain, brushed well and uniformly into the wood. Color to be as required. Pigments to be selected for their permanency of color. Vehicle to consist of 40 per cent of 160 degree benzole and 60 per cent raw linseed oil, all nail holes and other imperfections to be closed with lead putty colored to match stain, then apply one good coat of raw linseed oil containing 10 per cent turpentine. (See Note 3)

First Class—Specify one additional coat of oil containing 10 per cent turpentine. (See Note 3)

Staining Shingles.—Dip shingles two-thirds their length in stain specified as above, color to be determined. After shingles are in position touch up and apply one coat of linseed oil containing 10 per cent turpentine. (See Note 3).

Restaining of Exterior Wood Work.

Prepare and restain all or such portion of exterior wood work as may be found necessary, color conforming closely to original stain. Coat all stained wood work with two coats of linseed oil containing 10 per cent turpentine. Between first and second coats close up all imperfections with putty colored to match stain. (See Note 4)

Painting New Exterior Brick Work.

Paint all new exterior brick work two good coats of Venetian Red containing about 20 per cent white lead, the vehicle to consist of 80 per cent linseed oil and 20 per cent turpentine, after which apply one coat of Flat Brick Color, shade to be selected. Care must be exercised to cover thoroughly and cut in neatly each stretch so as to produce a uniform flat surface. This color must not be worked too thin. (See Note 5)

Repainting Old Exterior Brick Work.

Close up all open joints and other imperfections. Touch up with paint all such places including any portion from which the paint has been badly worn. Paint all exterior brick work, one coat of Venetian Red containing about 20 per cent white lead, the vehicle to consist of 80 per cent linseed oil and 20 per cent pure turpentine, after which apply one coat of Flat Brick color, shade to be selected. Care must be exercised to cover thoroughly and cut in neatly

each stretch so as to produce a uniform flat surface. This color must not be worked too thin. (See Notes 5 and 6)

Painting New Exterior Plaster, Cement and Concrete.

Prepare and close up all cracks and other surface imperfections with plaster or cement. To all surfaces apply a **thorough** coat of "Mac-nichol's Basic Coater," giving twenty-four hours to dry, after which apply three coats of paint, color to be selected, each coat to be thoroughly dry before the application of another. The plaster or cement must be thoroughly dry before painting. (See Note 7)

Repainting Old Exterior Plaster, Cement and Concrete.

Scrape off old paint where necessary, close up all cracks and other surface imperfections with plaster or cement. Apply a good coat of "Mac-nichol's Basic Coater" over all new cement or plaster, giving twenty-four hours to dry, after which apply two coats of paint, color to be selected, each coat to be thoroughly dry before the application of another. The plaster or cement must be thoroughly dry before painting. (See Note 7)

Painting Exterior New Iron and Steel.

First Class—All iron or steel work shall be gone over carefully before painting and any dirt or

corrosion shall be removed by the aid of steel brushes. Paint all iron work with one coat of "Kardite" chromatized red lead mixed on the job in the proportion of 25 lbs. to one gallon of pure linseed oil, or with "Kardite" Red Rust Inhibitive Paint," after which apply two coats of pure lamp black mixed with "Flexible Compound," or pure linseed oil, or any other pigment necessary to produce the desired color. In using "Flexible Compound" as a vehicle no **turpentine nor dryer** should be used, each coat must be thoroughly dry before applying another. (See Note 8)

Medium—All iron work shall be gone over carefully before painting and any dirt or corrosion shall be removed by the aid of steel brushes. Paint all iron work with one coat of Pure Red Lead, the vehicle being 80 per cent raw linseed oil and 20 per cent turpentine, after which apply two coats of pure lamp black with the addition of a small quantity of Prussian Blue, mixed with about 90 per cent linseed oil and 10 per cent turpentine. Each coat must be thoroughly dry before applying another. (See Note 9)

Repainting of Exterior Iron Fences, etc.

Remove all loose paint and corrosion by scraping and a steel brush. Touch up with Pure Red Lead all that portion from which the paint is removed. Paint all surfaces two coats pure lamp black, adding a small quantity of Prussian Blue,

with "Flexible Compound." Each coat must be thoroughly dry before applying another. Use no turpentine or dryer in this Compound. (See Note 9 and 8)

Painting Exterior Galvanized Iron.

All galvanized iron work shall receive one thorough coat of a solution made by dissolving 6 ounces, of Copper Acetate in one gallon of warm water. This preparation must be thoroughly brushed on, when dry apply one coat of Pure Red Lead mixed with 50 per cent linseed oil and 50 per cent turpentine, followed by two coats of paint, color to be selected. (See Note 10)

Painting Copper Work.

All copper surfaces to be thoroughly sponged off with 160 degree benzole, after which apply one coat of Pure Red Lead mixed with 50 per cent linseed oil and 50 per cent turpentine, well rubbed out. Then apply two coats of paint, color to be selected. (See Note 11)

Painting Tin Work.

Remove all rosin and other imperfections. Paint as soon as practicable all tin work one coat of Pure Red Lead mixed with 60 per cent raw linseed oil and 40 per cent turpentine, after which apply one coat of Venetian Red or Princes Metallic Brown, mixed in pure boiled oil. (See Note 12)

Plain Painting for Interior New Wood Work.

Shellac all knots and sap-wood, paint wood work (locating same) three good coats, color to be selected. After the first or priming coat close up with lead putty all nail holes and other imperfections. Do all necessary sandpapering between coats. (See Note 13)

Painting and Graining Interior New Wood Work.

Shellac all knots and sapwood, paint all wood work (locating same) two coats, no oil to be used in this paint other than that in which the lead is ground. In mixing use a small quantity of a good mixing varnish, thinning with turpentine so that the paint will dry with a flat egg shell gloss, sandpapering each coat perfectly smooth.

Grain in best manner in imitation of Hardwood to be selected, the graining color to be used as flat as possible, consisten with working out. Varnish all grained work one coat of a good wearing body varnish. (See Note 14)

Natural Finish for New Interior Soft Woods.

All wood work shall be thoroughly gone over, cleaned up and sandpapered where necessary, after which apply one coat of white shellac and two coats of a good wearing body varnish, the last coat to be evenly flowed on. After shellac-ing close up all nail holes and other imperfections with putty colored to match wood, being

careful to rub off any surplus putty. Sandpaper thoroughly between coats. (See Note 15)

Staining and Varnishing New Interior Soft Woods

All wood work shall receive one light coat of 25 per cent linseed oil and 75 per cent turpentine, sandpaper and stain in best manner with an oil stain containing about 50 per cent turpentine, color to be selected. Close up all nail holes and other imperfections with lead putty colored to match stain, being careful to wipe off any surplus putty marks. Varnish all stained work two good coats of a strong wearing body varnish, the last coat to be evenly flowed on. Sandpaper between coats, each coat to be thoroughly dry before another is applied. (See Note 16)

Painting and Enameling Interior New Wood Work

Medium—All wood work (specify location) shall be gone over carefully. Shellac all knots and sap portions. Prime with one thin coat of white paint, well brushed into the wood, after which sandpaper thoroughly, closing up all nail holes and other imperfections with lead putty. Apply one medium coat of pure grain alcohol white shellac. Sandpaper lightly. Apply three coats of white paint consisting of about 60 per cent white lead and 40 per cent zinc oxide, and one coat of straight pure zinc oxide, followed by one coat of best enamel, freely and evenly applied, all coats to be tinted as required. Each

coat must be thoroughly dry and well sandpapered before the application of another. (See Note 17)

First Class—Apply one additional coat to the above specification (four coats) after the shellac, followed by the straight zinc and two coats of best enamel, the last coat of enamel to be evenly rubbed with water and powered pumice stone to a satin or china gloss finish. (See Notes 17 and 18)

Painting New Plaster or Cement With Distemper Colors or Calcimine.

Close up all cracks and other imperfections with plaster or cement. After which apply one full coat of "Macnicol's Basic Coater," well brushed in, allowing twenty-four hours to dry. Then apply one medium or light coat of paint as a size, to consist of at least 50 per cent linseed oil, to be followed when dry with one full, free and even coat of calcimine or prepared distemper paint. If one coat of distemper paint does not produce a solid surface, one additional coat must be given. Thoroughly protect all surroundings. (See Note 19).

Painting and Varnishing New Interior Plaster and Cement Surfaces.

Medium—Close up all cracks and other imperfections with plaster or cement. Apply one full

coat of "Macnichol's Basic Coater" to all plaster or cement surfaces, brushed well in, giving twenty-four hours to dry, after which apply three coats of paint, color to be selected. Then apply one full coat of a good wearing varnish. Each coat to be perfectly dry before the application of another. (See Note 20)

First Class—Sandpaper all surfaces, close up with plaster or cement all cracks or other imperfections. Apply one full coat of "Macnichol's Basic Coater" well brushed in, giving twenty-four hours to dry, after which paint all surfaces four coats, color to be selected. The paint should be composed of 60 per cent white lead and 40 per cent pure zinc oxide, the first coat to contain about 50 per cent oil, 10 per cent of a good mixing varnish and 40 per cent turpentine, the three subsequent coats to contain about 30 per cent oil, 20 per cent varnish and 50 per cent turpentine, the last coat to be lightly and evenly stippled. Each coat must be thoroughly dry before the application of another. (See Notes 21 and 7)

Varnishing and Finishing of Hardwoods.

Medium—Sandpaper and remove all surfaces defects, stain if desired, fill with best paste filler, colored if necessary, thoroughly cleaning surface and mouldings. Shellac one coat and varnish two coats of a good varnish suitable for this

purpose. After the shellac coat, close up all nail holes and other imperfections with lead putty, colored as required, all surplus putty to be carefully wiped off. Sandpaper between each coat. Care must be taken during varnishing to keep the premises as free from dust as possible. (See Note 22)

First Class—Sandpaper and remove all surface defects. Stain if required. Fill with best paste filler, colored if necessary. Thoroughly clean all surfaces and mouldings. Shellac one coat pure grain alcohol shellac and varnish four coats of a first class varnish designed for this class of work. Rub all varnish surfaces true and even with oil and pumice stone to a dull satin finish. Thoroughly clean all oil and pumice stone from surface. Each coat must be thoroughly dry and sandpapered before the application of another. Care must be taken during varnishing to keep premises as free from dust as possible. (See Note 23)

Staining and Waxing of Hardwoods.

Medium—Stain all work with an approved stain, color to be selected. Do necessary sandpapering, after which apply one coat of paste filler, colored to conform with stain. Thoroughly clean all surfaces and apply one medium coat of shellac. Sandpaper lightly and apply one good coat of an approved finishing wax, permitting

it to stand until semi-hard, then to be thoroughly rubbed and polished to a hard surface. (See Note 24)

First Class—Coat all surfaces (specify location) with one medium coat of clean water (this for oak only). When thoroughly dry, sandpaper to a perfectly smooth finish, after which stain uniformly and in best manner with an approved water stain, color to be selected. Sandpaper lightly and fill with paste filler, colored to conform with stain. Apply one coat of pure grain alcohol shellac, sandpaper lightly, after which apply two coats of an approved finishing wax, giving three days between coats. Permit each coat to become semi-hard, then to be thoroughly rubbed and polished to a hard surface. (See Note 25)

Finishing Pine Floors.

Thoroughly cleanse and remove all surface imperfections, shellac one coat and varnish two coats of a good varnish designed for this purpose, each coat must be thoroughly dry before the application of another. All necessary care must be taken to protect this work from damage. (See Note 26)

Varnish Finish for Hardwood Floors.

Thoroughly cleanse and remove all surface imperfections. Fill all wood work with a good paste filler, cleaning thoroughly from surface.

Stain if required. Shellac one coat and varnish two coats of best varnish designed for floor use. Each coat must be thoroughly dry before the application of another. Care must be taken to protect floors from damage. (See Note 27)

Wax Finishing of Hardwood Floors.

Thoroughly cleanse and remove all surface imperfections, fill all wood surface with one coat of best paste filler, thoroughly cleansing same when semi-dry, from surface. Stain if required. Apply one thin even coat of pure grain alcohol shellac. Sandpaper lightly without showing laps, after which apply two coats of best "Prepared Floor Wax," giving two or three days between coats. Each coat must be thoroughly rubbed to a hard dry surface. Care must be taken to protect floors from damage. (See Note 28)

NOTES

Note 1.—All authorities agree that pure raw linseed oil and pure spirits of turpentine are the best vehicles for exterior paints. The vehicle of first or priming coat on new wood, also second coat, should consist of 80 per cent pure raw linseed oil and 20 per cent pure spirits of turpentine, the final coat 90 per cent pure raw linseed oil and 10 per cent pure spirits of turpentine, all to contain necessary driers. When four coats are used the first, second and third coats should be composed of 80 per cent oil and 20 per cent turpentine, the fourth coat 90 per cent oil and 10 per cent turpentine.

There exists some diversity of opinion as to the best paint pigment or pigments in combination. How necessary it should be that the construction of a paint film be as near perfect as possible. The necessity of this should be apparent to us all, especially when we are confronted with the fact that "the average paint coating is only three one-thousandths of an inch thick, and yet this thin coating is required to withstand expansion and contraction of the underlying surface, abrasion or wear from storms of dust and sand, or rain, sleet, hail, and absorbing, drawing and expanding influences of the summer's sun and contraction from the cold of win-

ter. It must have both hardness, to withstand to a reasonable extent this surface wear, and yet enough elasticity to meet internal strain and to conform to changes in the underlying surface, and it must penetrate and cling to the surface upon which it is applied. It must also retard and prevent from access to the underlying surface both the moisture and atmospheric gases which cause decay," and, if possessing the virtues of a good paint, it must in the course of time, when repainting becomes necessary, present a suitable foundation for the new paint coatings.

It is generally accepted that a white or tinted base paint containing about 75 per cent white lead and 25 per cent zinc oxide is of a high standard. When used near or at the sea shore, also in the southern states it can be improved by a change to the following: 60 per cent white lead and 40 per cent zinc oxide. The purpose in combining these two best paint pigments are, that the one makes strong the weak points of the other, giving us an ideal paint coating. The zinc makes the film stronger and harder, also practically non-absorbent by reason of those qualities and with its fineness of texture, fills up the voids caused by the coarser pigment. After a most thorough and practical personal investigation as to results I recommend the above combinations, having used them in my practice for years. I have the manufacturer combine and

ground the two pigments together, thereby getting a thorough amalgamation.

When the result required is a white or color tinted paint, it is advisable to use the same percentage of different basic pigments and coloring matter in all of the coats, on account of obtaining a uniform expansion and contraction, solidity of color, etc.

When "**Prepared Mixed Paints**" in paste form are used, the **limit** of inert pigments should be 15 per cent. This percentage may be composed of barytes, silica or asbestine, or a mixture of such pigments. To this amount there should be no objection as up to that extent these inerts have their values as part of a good paint film, but vehicle proportions as set forth should be followed.

The use of asbestine is principally to hold up in suspension the heavier pigments in the paint, its fluffy and rod-like form being valuable for this purpose. It is also said to act as a reinforcing pigment in the same way that iron bars act in reinforcing cement or concrete structures.

Straight white lead makes a splendid primer. Ochre should never be used, nor boiled linseed oil for under coatings. When the color of the finishing coat is required to be a strong solid color such as green, red, etc., by using these strong colored paints from the foundation up you will not get a solidity of body, therefore I

would suggest the use of a strong tinted white base for under coatings.

In the painting of cypress and southern yellow pine the vehicle in the priming coat and **priming coat only** should be 40 per cent of 160 degree benzole, 10 per cent pure spirits of turpentine and 50 per cent pure raw linseed oil, proceeding with the subsequent coats as specified above. The character of these woods is such as will not permit of the penetration of paint made by the usual vehicle practice. With the turpentine and the addition of benzole which is one of the greatest penetrating solvents of rosin, gums and grease known, they carry the oil and pigment when well brushed out, into the wood and it there finds a lodgment forming a substantial and permanent foundation for the subsequent coatings. The benzole like turpentine after performing its mission evaporates entirely leaving no residue. (See Dewar's article on "Modern Lumber as a Problem for the Painter.")

From the beginning to the finish of a first class residence or other important operation considerable time may elapse, not infrequently a year or more, therefore a necessity for the additional or fourth coat of paint. I would recommend for their distribution, after the priming or first coat and the necessary puttying up, that the second coat be applied, the third and fourth coats about the time of completion of building.

Another substantial reason for the fourth coat is that the householder realizing that he has a new residence is usually less watchful as to any necessity for repainting for a term of years.

With the application of the priming coat when the work is first put in place, followed by the two coats probably six months or a year after, such a condition will of necessity require repainting in probably less than four years. This proves the economy of the fourth coat which under average conditions lasts as a protective agency for probably six or seven years before the necessity for repainting arises.

Note 2.—In the work of repainting it is practically impossible to intelligently specify without being familiar with conditions, as so much depends upon them.

The basic paint pigments should be as specified in "Note 1." The proportions of vehicles for first coat must be determined by conditions. For instance if the vehicle of the old paint coatings are dried out, leaving an absorbing surface, hungry as it were, the vehicle for first coat should consist of about 75 per cent raw linseed oil and 25 per cent turpentine, second or final coat 90 per cent raw linseed oil and 10 per cent turpentine, or if the surface be hard and non-absorbing the proper proportions of vehicle for first coat should be about 50 per cent oil and 50 per cent turpentine, the final coat 90 per cent oil and

10 per cent turpentine. Not infrequently I have found it necessary in repainting from a number of causes to give all of the wood work three coats.

The overcoming of these imperfect conditions and producing the best results possible is largely a work of diagnosis consisting of about 75 per cent man and 25 per cent material. The remedy for the different ailments consists in the different proportions of the vehicle to meet the diversified conditions, and not with the pigments.

The paint burner ever being a menace, I would discourage its use where possible. In every instance I would have the owner of the building give his consent to its use, also that he notify his insurance company and get a permit from it consenting to its use.

Note 3.—This stain is suitable for all kinds of wood used for exterior finish. It must be remembered that a stain implies a transparent coloring and not a paint coating which is opaque. If it is desired to stain oak or cypress to a dark green or a dark brown color usually used on the timbering and finish of houses designed after the old English period, two coats of stain should be specified to get the necessary depth of color. To attempt this with one coat would result practically in a paint coating, with the covering or hiding the figure of the wood. If it is desired

to stain oak silver grey or other light colors but one coat is necessary. Shingles owing to depth of color required, frequently require a second coat of stain after they are set in place. The use of benzole in the stain as I have stated becomes the active penetrating factor, carrying the coloring matter and oil into the woods, it has about the same evaporating consistency as turpentine.

There being a substantial difference between a paint coating and a stain, therefore the stain specified can be used when necessary for both coats.

Where a perfectly flat surface is desired the second coat of oil may be an objection, but for durability I would recommend it, also for the reason that the oil gloss shortly flattens down.

There are a number of very good shingle stains on the market.

Note 4.—Restaining is also a work of diagnosis as to whether the entire work should be gone over with a light coat of stain or a portion, where the former is badly used up, and whether it should have one or two coats of oil. In this case an examination will quickly speak for itself. A coat of oil over the old stain will make quite a difference in appearance of old color.

Note 5.—If penciling or striping of joints in either white, black, or other color should be required,

specify same after the application of flat coat, the lines to be true to the size of brick and of uniform width.

There are a number of Paint manufacturers who make a first class prepared "Flat Brick Color," in red, buff and grey, each consisting of a number of shades, light, medium and dark, or they will furnish any required shade or color.

This specification applies to **flat red brick** finish. If a buff or grey, flat brick color is required, instead of Venetian Red, specify two coats of lead and oil paint, color to conform to brick selected. When a buff or grey brick color is desired it should be so stated in specifications, as a lead and zinc base paint costs considerable more than Venetian Red.

For a gloss finish in either red, buff or grey, or any other color, three full coats are required, the final coat containing about 90 per cent linseed oil and 10 per cent turpentine.

Note 6.—Do not expect the painter to be a brick mason. If any amount of repointing is necessary, make special arrangements for it.

Usually one coat of oil color is sufficient, but where it is badly worn, give two coats of an oil paint, as it is practically necessary to have a uniform gloss surface before applying the flat brick color.

For a bright gloss finish on old work in any color or shade, apply two full coats, the final

coat containing about 90 per cent oil and 10 per cent turpentine.

Note 7.—All practical painters will agree with me that in painting over plaster and cement surfaces many serious difficulties are encountered with a probability of much future trouble, by reason of the free lime and alkali formed in the drying out of these materials, they being a part of the composition of plaster and cements. Their destructive action on colors and paint vehicles are well known. A necessary qualification of a cement paint is, that its vehicle and embellishing properties (colors) be not impaired in its contact with the cement or lime. After some years of personal investigation and experience in the use of "Macnichol's Basic Coater," it has proven itself to me to be of inestimable value in the preparation of my plaster and cement surfaces for painting, or otherwise embellishing, by neutralizing those destructive agencies, without in any manner what-so-ever impairing the strength or virtue of the cement or lime. In fact deterioration of vehicle and colors are immune from those causes, also the elimination of the usual discolorations so objectionable, when applied over "Macnichol's Basic Coater." Scientific investigation into its action and merits has shown an improvement to the cement and lime. It should be freely applied and when dry it acts in a measure as a light sizing coat over which any paint can be applied with perfect safety.

A very necessary qualification of a cement paint is also its resisting and non-absorbing ability to keep out water and dampness. One hundred per cent of the present day cement paints are designed for that purpose. Eighty per cent of them shortly break down, owing to their faulty composition, in the use of practically unknown and not thoroughly tried out vehicles, also because of the disintegrating action of the alkali in the cement and lime. With the use of "Macnichol's Basic Coater" I have no hesitancy in recommending the use of the following paint: pigments, 70 per cent white lead, 30 per cent zinc oxide; vehicle, 80 per cent raw linseed oil, 20 per cent turpentine; for the last coat, 90 per cent raw linseed oil and 10 per cent turpentine, each coat to contain one pint of a good gum mixing varnish to the gallon of paint. It must be of good body and well worked into the surface, each coat to be thoroughly dry before the application of another.

If a semi-flat surface is desired for final coat reduce quantity of oil in same. There are a number of very good paints found on the market practically designed for this class of work, but I certainly would recommend the use of "Macnichol's Basic Coater" in conjunction with them. In the use of a semi-flat coat for a finish I would positively recommend the under coating to be of a good gloss for the reason that the more flat a paint is the more its absorbing properties, do

not overlook the fact that an outside cement paint is under consideration.

For old brick work repointed with cement or lime, before repainting, I would recommend a coat of "Macnichol's Basic Coater" as a preventive of the alkali in the pointing material from destroying the color of the paint.

No paint should be applied over dampness. It is not in accord with nature's laws that a paint film should withstand the actions emanating from a wet foundation and not disintegrate quickly. The observing painters know whereof I speak.

Note 8.—"Kardite Red Lead" is a chromatized preparation, it acting as an inhibitor of corrosion on iron and steel. "Kardite Red Rust Inhibitive Paint" can be purchased in the market in mixed form ready for application without reduction. See Bulletin on "The Preservation of Iron and Steel" by Drs. Allerton S. Cushman and H. A. Gardner, also write them for farther information concerning "Kardite Paint," care of The Institute of Industrial Research, Washington, D. C.

"Flexible Compound" is a special prepared oil containing compounds which make it very durable and water resisting, turpentine and dryer must not be used in connection with it, raw linseed oil may be used as a reducer to the extent of 50 per cent. I have used "Flexible Compound with splendid success, for structural iron

and steel, also for iron fencing I know of no better paint.

Note 9.—"Red Lead" when found to be pure is of exceptional merit as an iron and steel paint pigment. For structural work two coats may be applied. This lead is found to be very much adulterated, especially when purchased in bulk for large operations, but it can be procured pure. A circumstance comes to mind. A very large steel construction building was under erection. The Engineers' specifications called for "all steel work to be painted two coats of 'Pure Red Lead,' one at the mill, the other when assembled." The contractor bought and paid for what he supposed to be "Pure Red Lead." It having the color of that pigment, he took it for granted that it was the true article as specified and ordered by him. The operation was finished with it, but a portion of the so-called "Pure Red Lead" was procured from the building and on analysis it was found to contain 60 per cent Red Lead and 40 per cent Calcium Carbonate (Whiting) which is proven to be a **promoter** of corrosion.

Within the last year a process in the manufacture of Red Lead has been discovered which permits the painter to procure his red lead pure and in such a manner that it does not cake or harden in the package, thus eliminating its one great weakness.

Lamp black ground in linseed oil is also a first class pigment. For a more dense black add a small quantity of Prussian Blue. When this combination is mixed with "Flexible Compound" it produces a splendid paint for this purpose.

Note 10.—The adhesion of paint to the surface of galvanized iron has long been a problem to the painter, but it has been practically demonstrated that the preparation specified will remove the objectionable features if thoroughly applied. After this solution remains on the metal for 24 hours, it will have the effect of removing all the grease and other substances which interfere with proper painting. It will produce a blackened, coppered surface to paint upon, which will readily hold the paint. Other solutions, such as a nitric acid and muriatic acid, cause rusting of the iron surface and interfere with proper painting. The use of copper acetate, however, will not cause such conditions in any manner whatsoever. Copper acetate is simply a solution of metallic copper in strong vinegar. It can be made by the painter himself, but it is cheaper to buy it in the drug store and mix it in hot water as specified. I would strongly insist upon the first coat of paint being red lead with about 50 per cent raw linseed oil and 50 per cent turpentine. If the color desired for the finish coat be dark, one additional coat will be sufficient, but if white or a light tinted color it will require at least two coats.

Note 11.—The adhesion of paint to copper surfaces has been quite a problem, the trouble being caused by an oil or grease used to keep the surface of the copper from becoming tarnished or stained while in stock and transportation. With the removal of these by the use of benzole as a cleaner, followed by a hard drying body of red lead, this forming a firm foundation for the subsequent paint coatings permanent results are secured. The writer does not approve of the painting of copper.

Note 12.—For new tin work on roofs I would only recommend two coats of paint, and the application of one coat every two or three years thereafter. The tin being an unabsorbing body, and with the accumulation of paints on the surface, with the expansion and contraction of the metal, checking and alligatoring would very shortly appear. Also the snow and rain lying on the surface for an indefinite time, assists in creating the necessity for a careful watch of the tin roof work.

White lead or graphite paint should not be applied directly to the new tin work, but for subsequent coatings there is no objection to them.

Note 13.—If color required be white or lightly tinted, the wood work should first receive one coat of shellac to prevent discolorations from rosin and sapwood. If varnish coat should be required

over paint, specify all painted work to receive one coat of a good wearing light color varnish, evenly applied.

Note 14.—If a first class job is required specify one additional coat of varnish to be full and evenly applied, each coat to be thoroughly dried before the application of another. If a flat finish is required, specify the last coat of varnish to be rubbed evenly to a flat finish with crude oil and pumice stone, all oil and pumice stone to be thoroughly cleaned off at completion.

A flat finish may be secured by using what is termed a "Flat Varnish." In the use of a flat varnish two coats are required, the first being a gloss varnish. About 50 per cent of these varnishes contain a large percentage of wax, over which you cannot apply at any future time paint or varnish, as neither will adhere permanently to a wax surface. The use of some of these flat varnishes is commendable, especially in producing certain results on Natural Hardwoods.

Graining is practically becoming a lost art, owing to the general use of Hardwoods. Where the work is well done this specification should produce splendid results. Some painters may not agree with me in the number of coats and manner of mixing the ground coating; let them try it and they will find no cracking or crazing

of their varnish, but of course the varnish must be good and undercoating perfectly dry.

Woods best adapted to painting and graining are birch, cherry, maple, poplar and white pine.

Note 15.—This would apply to white pine, poplar, yellow pine, cypress, etc. Some times a flat finish is required; in that case specify the rubbing with oil and pumice stone to a dull even finish. I do not recommend close rubbing on two coats of varnish as it must be kept in mind that close rubbing will practically remove one coat of varnish. I do not recommend any rubbing for servants quarters, nor yet for the average medium job.

The natural color of these woods is sometimes an objection. In that case I add a "touch" of burnt sienna, or burnt and raw sienna, to the first coat of varnish, not sufficient to produce a stain, simply giving the wood a warm pleasing glow, removing the harshness of the natural color.

Note 16.—The purpose of applying a thin coat of oil to the wood work before staining is that certain portions of the surface may be very much softer than others, in fact it may appear in spots, all over. With the application of the oil as specified, you in a measure stop the suction of those soft places and get a practically uniform surface on which to work the stain. A thin coat of

shellac instead of the oil might be used, but I prefer the oil as thinned with the turpentine, as I will get a more uniform absorption into the wood for the stain, the shellac in a measure stopping absorption.

For a flat surface I would specify the rubbing with oil and pumice stone to a dull finish, for close rubbing I would specify one additional coat of varnish. This specification would apply to white and yellow pine, poplar, cypress, etc.

Note 17.—With the application of a second coat of enamel this specification may be rubbed with water and powdered pumice stone to a very good finish. If a semi-gloss or flat finish is desired with but one coat of enamel, reduce the enamel by mixing into it a portion of the straight zinc coater necessary to give the condition required. To fully obtain this result requires very careful brushing, so as not to show laps, brush marks and cording, but it can be accomplished very nicely.

With the exception of the priming coat no oil should be used except such as may be found in the stiff lead and zinc, the priming coat should consist of about 40 per cent oil and 60 per cent turpentine, light of body and well brushed into the wood. I have my zinc for enameling purposes ground in Poppy oil, which greatly minimizes the chances of the work turning yellow when confined to a dark room. The use of lin-

seed oil is a strong factor in the work turning yellow when excluded from a strong light. In the preparation of my several under paint coatings I use instead of oil as a binder, a portion of a good mixing enamel varnish, each coat must be worked flat. In using the straight zinc oxide for a final coat of paint on this class of work I find that I can get purer tints of greater variety, without the danger from chemical action that would result if I were to use some white leads.

The straight zinc coat, should have an "egg shell gloss" for the reason if it were perfectly flat such as the under paint coatings should be, it would absorb and draw the liquid properties from the enamel coat, leaving a surface of questionable uniformity.

The different coats of paint from the shellac up should be tinted as required for the finish for by so doing you get a solidity of tint that you otherwise would not. For a perfect white job we often times "draw the lead," that is we break up the lead in turpentine to a thin consistency, permitting it to stand twenty-four hours, then pour the surface liquid off and you have remaining lead practically free from oil. With the percentage of zinc oxide specified and with the use of a good white enamel varnish, or what is better a portion of the enamel as a binder reduced with pure turpentine to a working consistency, you have a ground work for enam-

el finish that cannot be equaled, provided you permit each coat to become thoroughly dry before the application of another. For a "dead white" we sometimes give the paint a "touch" of blue or black.

If for the finishing coat an enamel varnish should be specified instead of "Prepared Enamel" (and there are a number of good ones), specify that a small portion of the zinc coat be added to the varnish for the reason that there are no good light varnishes made that will not discolor pure white and very delicate tints. A **good enamel** is expensive, but it is worth the money.

The woods adapted for enameling are cherry, birch, maple, poplar and white pine.

Note 18.—This specification if faithfully carried out will produce splendid results. For this high class work cherry, birch, or plain maple should be used; good results can be secured on white pine or poplar.

Note 19.—There are quite a number of most excellent distemper preparations on the market known by different names. The old fashioned Calcimine still retains a substantial standing, largely owing to the ease with which it can be removed when refinishing becomes necessary. It is true the former is less absorbing, but extremely difficult to remove.

There are a number of very good sizes that could be used for this purpose, but I know of no better one than a good coat of oil paint, white or lightly tinted, applied direct on the "Basic Coater." Its virtues are manifold, for instance when about 50 per cent linseed oil is used in the paint, and when thoroughly dry, it produces a splendid working surface, also a permanent sizing surface for future refinishing, the old material can be readily cleansed from it, that is if the material used will permit of its being removed.

Under no consideration use a Varnish Coating for sizing purposes, as it does not permit of any absorption and is extremely hard, in fact it is impossible to produce an even and uniform surface on a high gloss. There is also a very great tendency for the calcimine to loosen and flake off on account of the hardness of the varnish surface, which does not permit either materials to enter into it.

Note 20.—If a bright gloss is objectionable, eliminate the coat of varnish. In the third coat specify that sufficient of a good mixing varnish to produce a dull gloss be mixed into this coat and when applied it should be stippled lightly to prevent laps or brush marks.

A varnish sizing gloss coat should never be applied direct on plaster or basic coater, for the reason that it does not penetrate, but dries on the surface, creating a substantial barricade,

which excludes and does not permit the subsequent paint coatings, to enter into the surface, and form a substantial foundation. The result of this condition being a letting go, cracking and scaling of both varnish size and paint, caused by the drying out, expansion and contraction. Would recommend for a sizing a good coat of paint containing at least 50 per cent linseed oil, with no objection to 10 or 15 per cent varnish, applied direct and well brushed into the plaster surface. When "Macnichol's Basic Coater" is used, the sizing coat should positively be applied **on top** of the basic coater.

Note 21.—This formula will produce a paint practically non-absorbing when properly applied, by reason largely of the fineness of the zinc oxide closing up all voids caused by the coarser pigments, also making the film stronger and not too hard.

This formula does not produce a perfectly flat finish. By reducing the oil and varnish in the last coat and increasing the amount of turpentine we can get any degree of flatness desired. A small quantity of wax thoroughly dissolved in turpentine and added to the final coat will also produce a flat finish. Of course practical judgment must be exercised in the use of these vehicles to get just what is desired. This should be wholly left with the painter. The pigments do not enter into the question of gloss

or no gloss. It must be remembered that the flatter a paint surface is the more liable it is to absorption and less its strength and resisting power to shield off surface abrasions.

If a strong gloss is desired, eliminate the stippling and apply one coat of a good wearing body varnish or a full coat of enamel evenly applied.

Very frequently for fine residences, the walls and ceilings of certain rooms are first covered with a light canvas of heavy unbleached muslin of an extra width, or with a "prepared muslin" or "sanitas" especially designed for painting purposes. In that case I would specify that the walls and ceilings (designating location) be properly prepared and sized. Cover all surfaces with prepared muslin or canvas of an extra width, size same and properly glaze with lead putty all open joints, then proceed with painting as specified. The "Macnichol Basic Coater" should be used applied directly to the plaster, it acting as a preventative against discolorations that frequently appear. I would recommend when a fabric covering is used that it be applied if possible to the walls before the putting in place of wood finish, so that around the different openings the wood may cover over a portion of the fabric. Of course the plaster must be thoroughly dry.

Splendid results have been attained by covering ceiling and walls of bath rooms above tile wainscoting with prepared Sanitas. paint three

coats, after which apply two coats of white enamel (or it may be tinted), the last coat to be rubbed with water and pumice stone to a china gloss. Care must be taken that the rubbing be uniform and not showing laps. This is very sanitary and easily cleaned.

Lately there has appeared on the market what is known as "Flat Wall Coaters." It is a paint intended for plaster surfaces. The novelty as well as popularity of these paints have also brought into the market many manufacturers of this article who have no scientific or practical knowledge of what should constitute a proficient and serviceable wall paint, but it must be acknowledged that among the many some can be found that are really proficient and are of most excellent appearance. The question at present is a perplexing one, what will be the results after repainting a number of times with the same or with a similar material applied? I personally at this time would not care to hazard an opinion. With many of them it is a new innovation both in pigment and vehicle and must speak for its self in time to come, but as I have said a number of the brands look and work splendidly, with promise of a good future. One great weakness among practically all of them is, that there is no distinction what-so-ever between the first and final coat. They are all of the one mix and sold as such it being a commercial proposition. The last coat shows a perfectly flat film. The first

coat being of the same identical composition and characteristics, is wholly unfit for a first coater, which to be proficient must penetrate into the plaster, which by nature of its composition it will not, simply drying on the surface. The result will be shortly a breaking away from the plaster surface with scaling and flaking. Nor has any precaution been taken to protect the vehicle and colors from the destructive alkali found in the plaster and cements, which is most deteriorating to both of these essentials. Therefore I would most earnestly recommend that all plaster and cement surfaces be first coated with "Macnichol's Basic Coater," allowing twenty-four hours to dry, and for the **first** coat of all prepared "Flat Wall Coaters." I would also add one-quarter gallon of linseed oil with a little dryer. That would cause the paint to penetrate into the plaster, forming a substantial foundation for subsequent coatings, with all danger of discolorations and deteriorating of vehicle and colors eliminated.

Many of these "Flat Wall Coaters" are here to stay, therefore the necessity of painter and manufacturer getting wise as to their proper use.

The stippling of paint should be done very lightly, simply an evening up as it were for the purpose of getting a uniform even surface. Coarse stippling should be avoided as it is most unsanitary, it providing a lodgment for microbes, etc., among the surface abrasions caused by

heavy stippling, also by reason of the difficulty in thoroughly cleansing, owing to its coarseness. I would recommend the abolishment of the interior style of plastering known as "sand finish" for the above reasons.

Many large office buildings hastening to completion require of the painter that he proceed with the painting of plaster and cement surfaces, when they are still in an undry condition, often times quite wet. Such demands are ruinous to future good results. A paint used over the above conditions at best is but temporary and must **not** contain any varnish, very little oil and no zinc oxide. It must be as soft as possible to permit the dampness to exhale through the paint to the surface. The alkali being still active owing to excess of dampness, staining, blistering and peeling of the paint is a sure result.

Note 22.—If the location of the finish justifies additional expense and a flat surface is desired, specify that the last coat of varnish be lightly rubbed with oil and pumice stone to a uniform dull finish, thoroughly cleansing surface from all oil and pumice stone. In servants' portions of residences this is not justifiable.

This specification pertains to all open grained woods such as oak, ash, chestnut, black walnut, etc. If cherry, birch, maple and such woods are used, frequently the filling with paste filler is eliminated, the shellac coating filling require-

ments. In my own operations I invariably use the filler as specified, but quite thin in body, carefully wiping off filler from surface. For birch stained in imitation of mahogany I always omit the filler, shellacing direct on the stain, as frequently chemical action takes place when oil is brought in direct contact with mahogany stain used on birch.

Note 23.—This specification applies to the finishing of red or white mahogany, cherry, birch, walnut, rosewood, etc.

Frequently in finishing mahogany or other woods stained with a water stain in imitation of mahogany or otherwise, after lightly sandpapering the stain, I apply a light coat of shellac direct on the stain, sandpaper lightly, then proceed with the filler and varnish as specified. White shellac should never be used on dark mahogany or mahogany stained, as it will in time bleach out white, showing a milky film under the varnish. I also frequently omit both the shellac and filler, applying direct to the stain a coat of linseed oil reduced one half with turpentine containing a little dryer. After this has remained on for some time, wipe off carefully any oil that may remain on the surface, allow that which the wood has absorbed to get perfectly dry, then proceed with the varnishing as specified. In this latter case four coats of varnish should be applied.

For white or birds-eye maple, holly, satin wood, etc., eliminate the filler and stain, specify two coats of pure grain alcohol **white** shellac and three coats of an extra pale varnish, designed for this class of work, rubbing and finishing as specified. In bringing oil into contact with these and similar woods it has a tendency to darken, whereas the purpose is to keep them as light and natural as possible.

For Italian or French walnut, circassian walnut and similar woods, where it is so important that the natural colors and shading be preserved, eliminate the filler and apply as above two coats of pure grain alcohol white shellac and three coats of a light varnish, rubbing and finishing as specified.

Fine carved work should never be varnished and rubbed as specified. Specify stain if necessary to conform with balance of wood, apply one light coat of shellac and two thin coats of wax, rubbed to a hard surface with stiff bristle brush. One medium or light coat of a good flat varnish in place of the wax will answer very nicely. The filler with the several coats of varnish will have a tendency to filling up and rounding the sharp edges and clean cutting so desirable in good carvings.

Note 24.— This specification will apply to oak, ash, chestnut, mahogany, cherry, etc. If a finish with open wood pores is desired, eliminate the filling, but add one additional coat of wax.

Note 25.—This specification applies to oak, ash, chestnut, red and white mahogany, cherry, black walnut, etc., and calls for splendid results. A water stain is mentioned, it being the best and most satisfactory in showing up to advantage the general beauty of the natural shadings and figure of the woods. In staining it should be emphasized that it does not mean a covering up, but rather the bringing out. In oil stains the coloring matter is largely composed of pigments of a different character and as a rule they are permanent, but they have a strong tendency to cover up. Spirit stains are hard to apply and the results unsatisfactory, the coloring matter very often being fugitive. Where it is possible to attain the color requirements by the use of a water stain, and their number is legion, I would recommend it above all other. All water stains raise the grain of the wood more or less, spirit stains very little and oil stains practically none. In 'connection with the use of water stain I specify an application of clear water to the oak wood direct (in my practice I find no harm to a good job of cabinet work accruing from its use), so that the surface particles may be raised, and then cut off with sandpaper so that the application of the water stain has no tendency to farther raise the grain. When the water coating is not used and the water stain is applied directly it requires so much sandpapering to recover again a smooth surface that

much of the stain and its effects are removed by the sandpapering. The water coating is very frequently omitted on less important work. When oil and spirit stains are used the water coat should be omitted, for other than oak wood it may also be omitted in the use of the water stain.

Very frequently to get desired results I apply a light coat of shellac direct on top of stain, after which I proceed with the filling as specified. I also frequently eliminate the shellac coating from on top of filler, applying wax direct on filler. The results desired must regulate the procedure.

When an open grain or pore effect is desired omit the filler, but add one additional light coat of shellac. It is very essential in this class of work that the shellac be applied thin and even, showing no laps or brush marks. If a perfectly flat or dead finish is required omit both filler and shellac coatings, waxing as specified direct on the stain, although I would recommend the one coat of shellac. If the natural colors of the woods are to be retained omit the staining and proceed as specified and observing above notes.

For white and birds-eye maple, satin wood, holly, French, Italian and Circassian walnut or any other similar woods, when required to be finished showing their natural colors, eliminate the water coat, stain and filler, specify two thin coats of pure grain alcohol **white** shellac evenly

applied direct on the wood without showing laps or brush marks, sandpapering thoroughly each coat, then proceed with waxing as specified. When well done this will give splendid results. Frequently mahogany and other woods than those specified above are finished after this manner. It is not unusual in procuring results to eliminate the shellac coatings, waxing as specified direct on the raw wood. When stain is necessary apply wax direct on same.

Often pleasing results can be obtained by using a first class dead or flat varnish. For instance if a perfectly dead finish is required on open pore surfaces, after applying the stain, sandpaper and apply one thin coat of shellac, sandpaper lightly and apply one coat of a good flat or dead varnish, eliminate the waxing. To get a still flatter effect eliminate the shellac also. This process is not recommended for durability, simply for its effect, and should only be used on open pore woods such as oak, where the broken effect of the wood surface destroys the varnish coating effect. In this window sashes and sills should be protected with a coat of good body varnish, when dry the gloss can be removed by rubbing.

Note 26.— This specification applies to white and yellow pine, also to maple. If this class of flooring is required to be stained, specify instead of the shellac, floors to receive one coat consisting of 25 per cent linseed oil and 75 per cent

turpentine, sandpaper and close up all imperfections. Apply one coat of stain consisting of 40 per cent linseed oil and 60 per cent turpentine, evenly brushed into the wood, color to be selected. Follow this with varnish as specified.

The so-called "Liquid Fillers," that is prepared fillers sometimes used to coat over the surface and permitted to remain there without rubbing off, should never be used, for the reason that they do not dry thoroughly throughout. Many of them also have a tendency to discolor the wood, especially when they begin to bleach out by reason of age, etc.

The object in going over this work with a very thin coating of oil and turpentine is, that if you were to apply the stain direct to the wood the result would be a clouded or mottled surface, owing to the natural characteristics of these different woods to absorb more in one spot or place than in another. Very little if any stain should be left on the surface. It should be absorbed uniformly by the wood, and be thoroughly dry before the application of the varnish coatings.

Where a dull finish is required, specify to be rubbed lightly with oil and pumice stone to a dull finish. A dull or flat varnish should never be used on floors.

Note 27.—Very frequently the color desired for these floors can be obtained by adding necessary coloring matter to the filler. The color of the shel-

lac (white or orange) should be determined by the color required.

If a flat finish is desired, specify to be rubbed with oil and pumice stone to an even dull surface. A dull rubbed surface does not show surface scratches or abrasions as readily as a bright varnish gloss. Under no consideration use a flat or "dead" varnish to procure this result.

For first class results you may eliminate the shellac coating and substitute one additional coat of varnish. It is very essential for best results that each coat be thoroughly dry before the application of another.

This style of finish is suitable for residences, but proper care must be exercised that it be not abused, for at best a varnished floor surface from the nature of it is more or less fragile.

Note 28.—This specification applies to practically all class of flooring woods and produces splendid results as a wax finish, being easily cared for by the house keeper simply going over the surface lightly with turpentine removing any surface dirt or imperfections, after which repolish with one coat of wax as specified. Especial care of the floor should be observed in front of the different doorways, as that portion receives the greatest amount of wear.

The whole secret of the success in obtaining a thoroughly practical waxed floor finish, is the recognition of the necessity of using a known good "Floor Wax." Then thoroughly hard-

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on each coat with the friction caused by good honest hard rubbing.

This manner of finishing as specified, while it produces the best appearing wax finished floor, has that which oftentimes is an objection, it being quite "slippery." To remove in a large measure this objection eliminate the coat of shellac from the specifications.

For dancing or ball room floors, I would apply the two coats of wax direct to the wood, of a necessity the wax must be good and the rubbing hard, allowing two days between coats.

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